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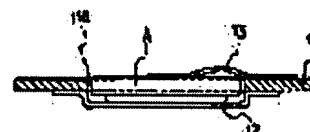
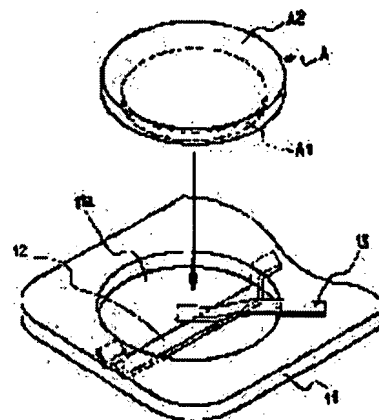
(72)Inventor : KUBOKAWA MINORU

(54) MOUNTING STRUCTURE OF BUTTON BATTERY

(57)Abstract:

PROBLEM TO BE SOLVED: To thin an apparatus, by providing an engagement part to fit a battery terminals with both positive and negative polarities in the vicinity of the engagement part, in a circuit board, and by fitting the battery in the engagement part to force the terminal of a battery into contact with a terminal on the circuit board side and to mount the battery to the circuit board.

SOLUTION: If this button battery A is engaged with a hole 11a, a terminal A1 is brought into contact with a terminal 12, a terminal A2 is brought into contact with a terminal 13, and it is mounted to a circuit board 11 by being sandwiched between the terminal 12 and the terminal 13 by elasticity of the terminal 13. The engagement part is desirably a bored hole on the circuit board or a notched hole cut on the circuit board, in compliance with the shape of the button battery. It is desirable that the terminals provided on the circuit board are projected toward the engagement part, at least either one of them is formed by an elastic material, and the battery is sandwiched by the terminals each other. Thereby, a thickness equal to that for the circuit board can be neglected.



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(21) 出願番号	特願平10-315103	(71) 出願人	000000295 沖電気工業株式会社 東京都港区虎ノ門1丁目7番12号
(22) 出願日	平成10年11月5日 (1998.11.5)	(72) 発明者	窪川 稔 東京都港区虎ノ門1丁目7番12号 沖電気 工業株式会社内
		(74) 代理人	100069615 弁理士 金倉 喬二
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(54) 【発明の名称】 ボタン電池の取付構造

(57) 【要約】

【課題】 ボタン電池の取付構造を改良し、ボタン電池を内蔵する機器の厚さを薄くしようとする課題があった。

【解決手段】 ボタン電池Aは、孔11aに嵌合することで、端子A1が端子12と接触し、端子A2が端子13と接触し、端子13の弾性力により端子12と端子13とで挟み込まれて回路基板11に取り付けられる。

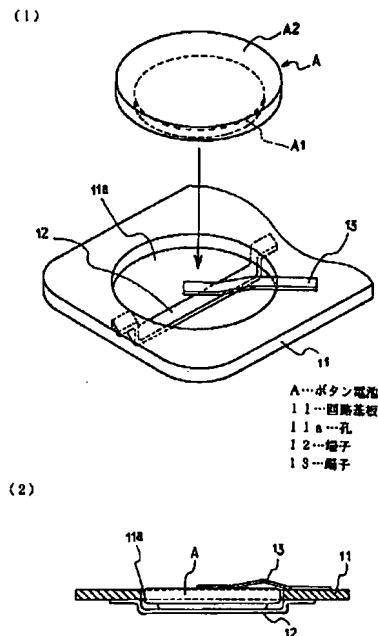


図1の発明の形態のボタン電池取付構造の説明図

【特許請求の範囲】

【請求項1】 ボタン電池を回路基板に取り付けるボタン電池の取付構造において、

回路基板には、ボタン電池を嵌め込む嵌合部と、この嵌合部の近傍に正負の両極性の端子を設け、前記嵌合部にボタン電池を嵌め込んでボタン電池の端子を回路基板側の前記端子と接触させて、ボタン電池を回路基板に取り付けるようにしたことを特徴とするボタン電池の取付構造。

【請求項2】 請求項1において、嵌合部を、ボタン電池の形状に合わせて回路基板に穿った孔としたことを特徴とするボタン電池の取付構造。

【請求項3】 請求項1において、嵌合部を、ボタン電池の形状に合わせて回路基板を切り欠いた切り欠き孔としたことを特徴とするボタン電池の取付構造。

【請求項4】 請求項1において、回路基板に設けた端子を嵌合部に向けて突出させ、その少なくとも一方を弾性材で形成し、その端子同士でボタン電池を挟み込むようにしたことを特徴とするボタン電池の取付構造。

【請求項5】 請求項1において、回路基板に設けた端子の一方を嵌合部に向けて突出させ、他方を嵌合部の周縁に配置し、回路基板を覆うカバーによってボタン電池を押さえつけることで突出した端子がボタン電池の端子に接触するようにしたことを特徴とするボタン電池の取付構造。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、ボタン電池の取付構造に関し、さらに詳しくは、コイン形電池ともいわれる薄い形状のボタン電池を回路基板に取り付けるボタン電池の取付構造に関し、特に、自動車用キーレストランスマッター等の携帯機器等の機器にボタン電池を内蔵させるのに有用な技術である。

【0002】

【従来の技術】図5は、従来のボタン電池取付構造の説明図であり、(1)にボタン電池取付前の斜視図を示し、(2)にボタン電池取付後の側面図を示す。図において、回路基板51には、ばね構造をもった端子52と端子53が半田付けにより接続して設けてある。ボタン電池Aは、コイン形電池とも呼ばれ、薄い円柱状をしており、図中下側に陰極の端子A1を、図中上側及び周縁に負極の端子A2を形成している。

【0003】ボタン電池Aは、(2)に示すように、端子A1が端子52と接触し、端子A2が端子53と接触して回路基板51上に、ケース体54の内側で押しつけられて取り付けられるようになっていた。

【0004】

【発明が解決しようとする課題】しかしながら、上記従来のボタン電池の取付構造では、回路基板上に端子及びボタン電池を組み上げていく構造のため、機器の厚さを

薄くするのに限界があり、設計上の制約となる問題があった。

【0005】

【課題を解決するための手段】本発明は、ボタン電池を回路基板に取り付けるボタン電池の取付構造において、回路基板には、ボタン電池を嵌め込む嵌合部と、この嵌合部の近傍に正負の両極性の端子を設け、前記嵌合部にボタン電池を嵌め込んでボタン電池の端子を回路基板側の前記端子と接触させて、ボタン電池を回路基板に取り付けるようにしたことを構成上の特徴とする。

【0006】なお、嵌合部を、ボタン電池の形状に合わせて回路基板に穿った孔としたり、ボタン電池の形状に合わせて回路基板を切り欠いた切り欠き孔とするのが好ましい。また、回路基板に設けた端子を嵌合部に向けて突出させ、その少なくとも一方を弾性材で形成し、その端子同士でボタン電池を挟み込むのが好ましい。さらにまた、回路基板に設けた端子の一方を嵌合部に向けて突出させ、他方を嵌合部の周縁に配置し、回路基板を覆うカバーによってボタン電池を押さえつけることで突出した端子がボタン電池の端子に接触するようにしてもよい。

【0007】

【発明の実施の形態】以下、図面を参照して、本発明の実施の形態を説明する。なお、これによりこの発明が限定されるものではない。

第1の実施の形態

図1は、第1の実施の形態のボタン電池取付構造の説明図であり、(1)にボタン電池取付前の斜視図を示し、(2)にボタン電池取付後の側面図を示す。図において、回路基板11には、ボタン電池Aの直径よりも若干大きめでボタン電池Aを嵌合させる嵌合部としての孔11aが穿ってあり、この孔11aの下側には孔11aを遮るように端子12を半田付けしてあり、その上側には弾性材で形成した端子13を片持ち自由端に半田付けにより接続して設けてある。ボタン電池Aは、コイン形電池とも呼ばれ、薄い円柱状をしており、図中下側に陰極の端子A1を、図中上側及び周縁に負極の端子A2を形成している。

【0008】ボタン電池Aは、(2)に示すように、孔11aに嵌合することで、端子A1が端子12と接触し、端子A2が端子13と接触し、端子13の弾性力により端子12と端子13とで挟み込まれて回路基板11に取り付けられる。以上のように、上記第1の実施の形態によると、回路基板に設けた孔にボタン電池を嵌合させて取り付けようとしたため、回路基板分の厚みを無視することができるようになり、機器の厚さを薄くできる効果が得られる。

【0009】第2の実施の形態

図2は、第2の実施の形態のボタン電池取付構造の説明図であり、(1)にボタン電池取付前の斜視図を示し、

(2)にボタン電池取付後の側面図を示す。図において、回路基板21には、ボタン電池Aの直径よりも若干大きめでボタン電池Aを嵌合させる嵌合部としての切り欠り孔21aが切り欠いてあり、この切り欠り孔21aの下側には切り欠り孔21aを下側を遮るように端子22を半田付けしてあり、その上側には弾性材で形成した端子23を片持ち自由端に半田付けにより接続して設けてある。ボタン電池Aは上記第1の実施の形態と同様なので説明を省略する。

【0010】ボタン電池Aは、(2)に示すように、切り欠り孔21aに嵌合することで、端子A1が端子22と接触し、端子A2が端子23と接触し、端子23の弾性力により端子22と端子23とで挟み込まれて回路基板21に取り付けられる。なお、切り欠り孔21aは側面側が開放状態であるため、ボタン電池Aを側面から挿入する。

【0011】以上のように、上記第2の実施の形態によると、回路基板に設けた切り欠り孔にボタン電池を嵌合させて取り付けるようにしたため、回路基板分の厚みを無視することができるようになり、機器の厚さを薄くできる効果が得られる。また、ボタン電池を側面から挿入することができるため、電池交換が容易である。

第3の実施の形態

図3は、第3の実施の形態のボタン電池取付構造の説明図であり、(1)にボタン電池取付前の斜視図を示し、(2)にボタン電池取付後の側面図を示す。図において、回路基板31には、ボタン電池Aの直径よりも若干大きめでボタン電池Aを嵌合させる嵌合部としての切り欠り孔31aが切り欠いてあり、この切り欠り孔31aの下側には切り欠り孔31aを下側を遮るように弾性材で形成した端子32を片持ち自由端に半田付けしてあり、その上側には弾性材で形成した端子33を片持ち自由端に半田付けにより接続して設けてある。ボタン電池Aは上記第1の実施の形態と同様なので説明を省略する。

【0012】ボタン電池Aは、(2)に示すように、切り欠り孔31aに嵌合することで、端子A1が端子32と接触し、端子A2が端子33と接触し、端子32と端子33の弾性力により端子32と端子33とで挟み込まれて回路基板21に取り付けられる。なお、切り欠り孔31aは側面側が開放状態であるため、ボタン電池Aを側面から挿入する。

【0013】以上のように、上記第3の実施の形態によると、回路基板に設けた切り欠り孔にボタン電池を嵌合させて取り付けるようにしたため、回路基板分の厚みを無視することができるようになり、機器の厚さを薄くできる効果が得られる。また、ボタン電池を側面から挿入することができるため、電池交換が容易である。さらに、端子が片持ち自由端に半田付けされるため、半田付け工程が少なく済む。

【0014】第4の実施の形態

図4は、第4の実施の形態のボタン電池取付構造の説明図であり、(1)にボタン電池取付前の斜視図を示し、(2)にボタン電池取付後の側面図を示す。図において、回路基板41には、ボタン電池Aの直径よりも若干大きめでボタン電池Aを嵌合させる嵌合部としての切り欠り孔41aが切り欠いてあり、この切り欠り孔41aの下側には切り欠り孔41aを下側を遮るように弾性材で形成した端子42を片持ち自由端に半田付けしてあり、その上側には切り欠り孔41aの周縁に配置した端子43を半田付けにより接続して設けてある。ボタン電池Aは上記第1の実施の形態と同様なので説明を省略する。

【0015】ボタン電池Aは、(2)に示すように、切り欠り孔41aに嵌合することで、端子A1が端子42と接触し、端子A2が端子43と接触し、回路基板41を覆うケース体44、45によって押さえつけられて回路基板41に取り付けられる。以上のように、上記第4の実施の形態によると、回路基板に設けた切り欠り孔にボタン電池を嵌合させて取り付けるようにしたため、回路基板の厚み、少なくともボタン電池の陰極の端子の厚さを無視することができるようになり、機器の厚さを薄くできる効果が得られる。また、ケース体でボタン電池を支持するため、ボタン電池の取付を正確に行うことができる。

【0016】

【発明の効果】以上説明したように本発明のボタン電池の取付構造によると、回路基板に設けた嵌合部にボタン電池を嵌合させて取り付けるようにしたため、回路基板分の厚みを無視することができるようになり、機器の厚さを薄くできる効果が得られる。

【図面の簡単な説明】

【図1】第1の実施の形態のボタン電池取付構造の説明図

【図2】第2の実施の形態のボタン電池取付構造の説明図

【図3】第3の実施の形態のボタン電池取付構造の説明図

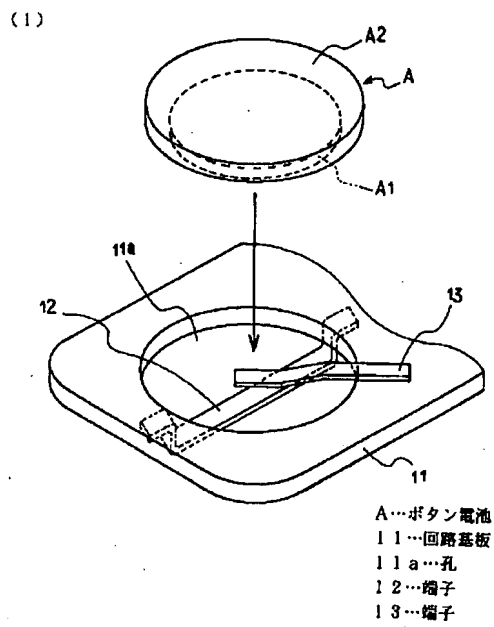
【図4】第4の実施の形態のボタン電池取付構造の説明図

【図5】従来のボタン電池取付構造の説明図

【符号の説明】

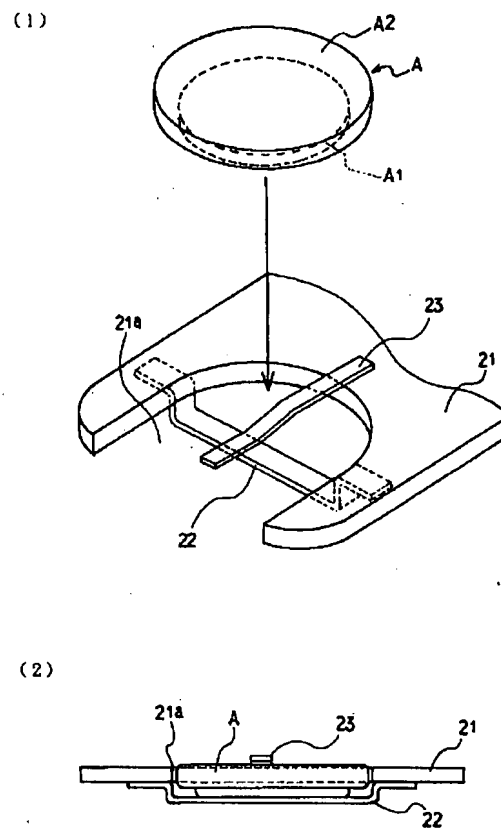
11, 21, 31, 41 回路基板
11a, 21a, 31a, 41a 孔
12, 22, 32, 42 端子
13, 23, 33, 43 端子
A ボタン電池
A1 端子
A2 端子

【図1】



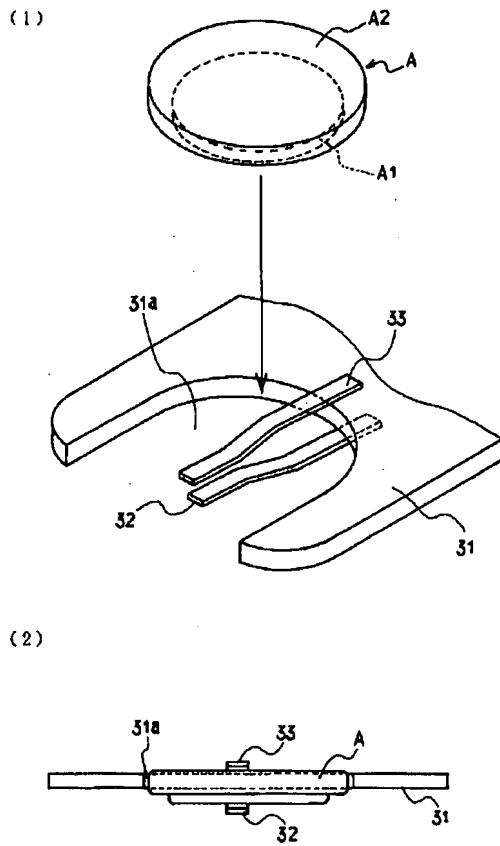
第1の実施の形態のボタン電池取付構造の説明図

【図2】



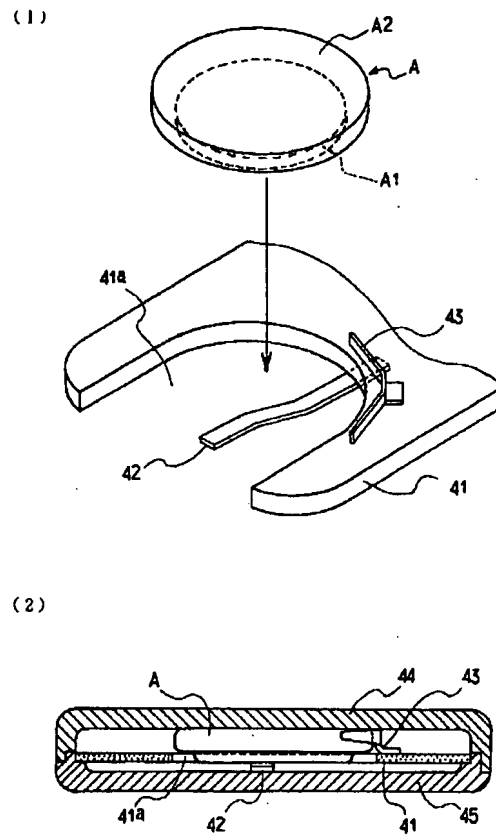
第2の実施の形態のボタン電池取付構造の説明図

【図3】



第3の実施の形態のボタン電池取付構造の説明図

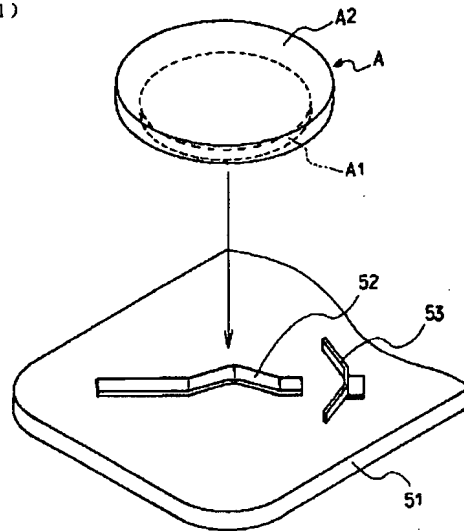
【図4】



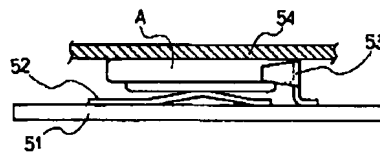
第4の実施の形態のボタン電池取付構造の説明図

【図5】

(1)



(2)



従来のボタン電池取付構造の説明図

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CLAIMS

[Claim(s)]

[Claim 1] Attachment structure of the carbon button cell characterized by preparing the terminal of the amphipathy of positive/negative in the attachment structure of a carbon button cell of attaching a carbon button cell in the circuit board, near the fitting section which inserts a carbon button cell in the circuit board, and this fitting section, inserting a carbon button cell in said fitting section, contacting the terminal of a carbon button cell for said terminal by the side of the circuit board, and attaching a carbon button cell in the circuit board.

[Claim 2] Attachment structure of the carbon button cell characterized by considering as the hole which doubled the fitting section with the configuration of a carbon button cell, and dug it to the circuit board in claim 1.

[Claim 3] Attachment structure of the carbon button cell characterized by having doubled the fitting section with the configuration of a carbon button cell, having cut and lacked the circuit board in claim 1, and considering as *****.

[Claim 4] Attachment structure of the carbon button cell characterized by turning to the fitting section the terminal prepared in the circuit board, making it project in claim 1, forming at least one of these by elastic material, and putting a carbon button cell with the terminals.

[Claim 5] Attachment structure of the carbon button cell characterized by making it the terminal which turn to the fitting section one side of the terminal prepared in the circuit board, and it was made to project in claim 1, and has arranged another side to the periphery of the fitting section, and projected the circuit board by pressing down a carbon button cell with wrap covering contact the terminal of a carbon button cell.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is a technique useful to making a carbon button cell build in devices, such as pocket devices, such as a key loess transmitter for automobiles, especially in more detail about the attachment structure of a carbon button cell about the attachment structure of a carbon button cell of attaching the carbon button cell of the thin configuration called coin form cell in the circuit board.

[0002]

[Description of the Prior Art] Drawing 5 is the explanatory view of the conventional carbon button cell attachment structure, shows the perspective view before carbon button cell attachment to (1), and shows the side elevation after carbon button cell attachment to (2). In drawing, the terminal 52 and terminal 53 which had spring structure in the circuit board 51 connect by soldering, and are prepared. The carbon button cell A is also called a coin form cell, is carrying out the shape of a thin cylinder, and forms the terminal A2 of a negative electrode in a drawing Nakagami side and a periphery for the terminal A1 of cathode at the drawing Nakashita side.

[0003] As shown in (2), a terminal A1 contacts a terminal 52, a terminal A2 contacts a terminal 53, and the carbon button cell A is pushed and attached by the inside of the case object 54 on the circuit board 51.

[0004]

[Problem(s) to be Solved by the Invention] However, with the attachment structure of the above-mentioned conventional carbon button cell, for the structure which finishes setting up a terminal and a carbon button cell on the circuit board, the limitation was to make thickness of a device thin and there was a problem used as the constraint on a design.

[0005]

[Means for Solving the Problem] In the attachment structure of a carbon button cell of attaching a carbon button cell in the circuit board, this invention prepares the terminal of the amphipathy of positive/negative near the fitting section which inserts a carbon button cell in the circuit board, and this fitting section, inserts a carbon button cell in said fitting section, contacts the terminal of a carbon button cell for said terminal by the side of the circuit board, and is characterized by attaching a carbon button cell in the circuit board on a configuration.

[0006] In addition, it is desirable to have cut and lacked the circuit board according to the configuration of a carbon button cell in to consider as the hole which doubled the fitting section with the configuration of a carbon button cell, and dug it to the circuit board ****, and to consider as *****. Moreover, it is desirable to turn to the fitting section the terminal prepared in the circuit board, to make it project, to form at least one of these by elastic material, and to put a carbon button cell with the terminals. Turn to the fitting section one side of the terminal prepared in the circuit board, it is made to project further again, another side is arranged to the periphery of the fitting section, and you may make it the terminal which projected the circuit board by pressing down a carbon button cell with wrap covering contact the

terminal of a carbon button cell.

[0007]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. In addition, thereby, this invention is not limited.

Gestalt drawing 1 of the 1st operation is the explanatory view of the carbon button cell attachment structure of the gestalt of the 1st operation, shows the perspective view before carbon button cell attachment to (1), and shows the side elevation after carbon button cell attachment to (2). In drawing, it is larger than the diameter of the carbon button cell A a little, and hole 11a as the fitting section to which fitting of the carbon button cell A is carried out is dug, the terminal 12 is soldered to this hole 11a bottom so that hole 11a may be interrupted, and the terminal 13 formed by elastic material is connected to the cantilever free end by soldering, and it has prepared in that bottom at the circuit board 11. The carbon button cell A is also called a coin form cell, is carrying out the shape of a thin cylinder, and forms the terminal A2 of a negative electrode in a drawing Nakagami side and a periphery for the terminal A1 of cathode at the drawing Nakashita side.

[0008] As shown in (2), the carbon button cell A is fitting into hole 11a, and a terminal A1 contacts a terminal 12, a terminal A2 contacts a terminal 13, is put by the elastic force of a terminal 13 with a terminal 12 and a terminal 13, and it is attached in the circuit board 11. As mentioned above, since according to the gestalt of implementation of the above 1st the hole prepared in the circuit board is made to carry out fitting of the carbon button cell and it was attached in it, the thickness for the circuit board can be disregarded now and the effectiveness which can make thickness of a device thin is acquired.

[0009] Gestalt drawing 2 of the 2nd operation is the explanatory view of the carbon button cell attachment structure of the gestalt of the 2nd operation, shows the perspective view before carbon button cell attachment to (1), and shows the side elevation after carbon button cell attachment to (2). It is larger than the diameter of the carbon button cell A a little, in drawing, end ***** 21a as the fitting section to which fitting of the carbon button cell A is carried out is cut and lacked in the circuit board 21, the terminal 22 is soldered to it so that it may cut to this end ***** 21a down side and the bottom may be interrupted for ***** 21a, and the terminal 23 formed by elastic material is connected to the cantilever free end by soldering, and it has prepared in that bottom. Since the carbon button cell A is the same as that of the gestalt of implementation of the above 1st, explanation is omitted.

[0010] As shown in (2), the carbon button cell A is fitting into end ***** 21a, and a terminal A1 contacts a terminal 22, a terminal A2 contacts a terminal 23, is put by the elastic force of a terminal 23 with a terminal 22 and a terminal 23, and it is attached in the circuit board 21. In addition, since a side-face side is in an open condition, end ***** 21a inserts the carbon button cell A from a side face.

[0011] As mentioned above, according to the gestalt of implementation of the above 2nd, it had prepared in the circuit board, and since fitting of the carbon button cell is carried out to ***** and it was attached in it, the thickness for the circuit board can be disregarded now and the effectiveness which can make thickness of a device thin is acquired. Moreover, since a carbon button cell can be inserted from a side face, a changing battery is easy.

Gestalt drawing 3 of the 3rd operation is the explanatory view of the carbon button cell attachment structure of the gestalt of the 3rd operation, shows the perspective view before carbon button cell attachment to (1), and shows the side elevation after carbon button cell attachment to (2). In drawing, to the circuit board 31, it is larger than the diameter of the carbon button cell A a little, and end ***** 31a as the fitting section to which fitting of the carbon button cell A is carried out is cut and lacked in it. The terminal 32 formed by elastic material is soldered to the cantilever free end so that it may cut to this end ***** 31a down side and the ***** 31a ** bottom may be interrupted, and the terminal 33 formed by elastic material is connected to the cantilever free end by soldering, and it has prepared in that bottom. Since the carbon button cell A is the same as that of the gestalt of implementation of the above 1st, explanation is omitted.

[0012] As shown in (2), the carbon button cell A is fitting into end ***** 31a, and a terminal A1 contacts a terminal 32, a terminal A2 contacts a terminal 33, is put by the elastic force of a terminal 32 and a terminal 33 with a terminal 32 and a terminal 33, and it is attached in the circuit board 21. In

addition, since a side-face side is in an open condition, end ***** 31a inserts the carbon button cell A from a side face.

[0013] As mentioned above, according to the gestalt of implementation of the above 3rd, it had prepared in the circuit board, and since fitting of the carbon button cell is carried out to ***** and it was attached in it, the thickness for the circuit board can be disregarded now and the effectiveness which can make thickness of a device thin is acquired. Moreover, since a carbon button cell can be inserted from a side face, a changing battery is easy. Furthermore, since a terminal is soldered to the cantilever free end, there are few soldering processes and they end.

[0014] Gestalt drawing 4 of the 4th operation is the explanatory view of the carbon button cell attachment structure of the gestalt of the 4th operation, shows the perspective view before carbon button cell attachment to (1), and shows the side elevation after carbon button cell attachment to (2). In drawing, to the circuit board 41, it is larger than the diameter of the carbon button cell A a little, and end ***** 41a as the fitting section to which fitting of the carbon button cell A is carried out is cut and lacked in it. It cuts to this end ***** 41a down side, and the terminal 42 which formed ***** 41a by elastic material so that the bottom might be interrupted is soldered to the cantilever free end, and the terminal 43 which cut to that up side and has been arranged to the periphery of ***** 41a is connected by soldering, and it has prepared. Since the carbon button cell A is the same as that of the gestalt of implementation of the above 1st, explanation is omitted.

[0015] As shown in (2), it is fitting into end ***** 41a, and a terminal A1 contacts a terminal 42, a terminal A2 contacts a terminal 43, is pressed down with the wrap case objects 44 and 45 in the circuit board 41, and the carbon button cell A is attached in the circuit board 41. As mentioned above, according to the gestalt of implementation of the above 4th, it had prepared in the circuit board, and since fitting of the carbon button cell is carried out to ***** and it was attached in it, the thickness of the terminal of the cathode of a carbon button cell can be disregarded now at least, and the thickness of the circuit board and the effectiveness which can make thickness of a device thin are acquired. Moreover, since a carbon button cell is supported with a case object, a carbon button cell can be attached correctly.

[0016]

[Effect of the Invention] Since according to the attachment structure of the carbon button cell of this invention fitting of the carbon button cell is carried out to the fitting section prepared in the circuit board and it was attached in it as explained above, the thickness for the circuit board can be disregarded now and the effectiveness which can make thickness of a device thin is acquired.

[Translation done.]

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TITLE: Button battery attachment structure for
circuit board of wireless key, inserts battery into hole in
circuit board such that its terminal contact with that of
board

PATENT-ASSIGNEE: OKI ELECTRIC IND CO LTD[OKID]

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PATENT-FAMILY:

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BASIC-ABSTRACT:

NOVELTY - The button battery (A) is inserted into a hole (11a) in the
circuit board (11) such that its terminals (A1,A2) contact the terminals
(12,13) of the
circuit board.

USE - For attaching button battery in circuit board of wireless key
of motor
vehicles.

ADVANTAGE - Since the battery is inserted into the hole of the
circuit board,
thickness of wireless key is reduced considerably.

DESCRIPTION OF DRAWING(S) - The figure shows a button battery attachment structure.

Circuit board 11

Hole 11a

Terminals of **circuit board** 12,13

Button battery A

Terminals A1,A2

CHOSEN-DRAWING: Dwg.1/5

DERWENT-CLASS: V04 X16

EPI-CODES: V04-Q02A; V04-S03; V04-T01; V04-T01C; X16-F06;